

Work Order ID 131616

Monday, April 20, 2015 10:11:45 AM

131616

Page 1

Item ID: D2741

Revision ID:

Item Name: Replacement Blade

Start Date: 4/20/2015 Start Qty: 30.00

Required Date: 4/20/2015 Req'd Qty: 30.00

Reference:

Approvals: Process Plan: MLS Date: 15-04-20

QC: _____ Date: _____ SPC (Y/N): A

Sequence ID/
Work Center ID

Operation
Description

Set Up/
Run Hours

Tool ID

Tool #

Plan
Code

Accept
Qty

Reject
Qty

Reject
Number

Insp.
Stamp

Draw Nbr

Revision Nbr

D2741

E

100

100

Bandsaw

Jeaspa Bandsaw

BAND SAW

Memo

Cut blanks 13.850" long +0.063" -0.000"

0.00

0.00

32

Ø

15/04/24

110

110

HAAS 1

HAAS CNC vertical machine #1

HAAS CNC VERTICAL MACHINING #1

Memo

1-Machine per folio FA108

0.02

0.11

32

Ø

DAS
25
9-89

15/04/24

SEE NOTE 9 FOR HOLES

120

120

QC

Quality Control

QC2- Inspect parts off machine FAI/FAIB

Memo

0.00

0.01

32

Ø

DAS
25
9-89

15/04/24

Accept ***N900040100*** Setup Start ***NS1***
Stop ***NS2***
Cust Item ID:
Customer:

Run Start ***NR1***
Stop ***NR2***

DQA: _____ Date: _____



WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: _____ Date: _____

Work Order update only ☐

Work Order: _____ Part No. _____ NCR No. _____	DISPOSITION Rework ☐ Scrap ☐ Use-as-is ☐ Suspected Unapproved ☐	AGAINST DEPARTMENT/PROCESS Skid-tube ☐ Machining ☐ Thermoforming ☐ Large Fab ☐ Cross tube ☐ Small Fab ☐ Finishing ☐ Composite ☐ Water Jet ☐ Prod. Eng. Coord. ☐ Rec/Store/Packaging ☐ Supplier ☐ Engineering ☐ Quality ☐ Other ☐			
Date :	Step #:	QTY Effective :		MRB (QSI042) Approval	
Description Work Order Deviation		Disposition		Completed By	
				Lead hand / Supervisor Approval Verification	
				QC / QA Coordinator Approval	
Root Cause Environment ☐ Design ☐ Doc/Data ☐ Equip/Tooling ☐ Handling/Pre ☐ Material ☐ Internal Transport ☐ Tribal Knowledge ☐ LOA ☐ Substation ☐ Past Expiry Date ☐ Misidentified ☐ No Re-verification ☐ Operator ☐ Offset/Setup ☐ Supplier ☐ Training ☐ Use for Testing ☐ Poor Information ☐ Rushing ☐ Product Improvement ☐ Process Improvement ☐ Manufacturing Process ☐ Past Due ☐		FAULT CATEGORY Pressure/Forced ☐ Bending ☐ Centre Not Concentric ☐ Cracks ☐ Crimp/Kink/Ripple/Wave ☐ Cuffs ☐ Crushing ☐ Heat Treat ☐ Wave/Twist in Tube ☐ Marks/Chatter ☐ Temperature/Cure ☐ Set-up ☐ BOM/Route ☐ Broken/Damage/Defect ☐ Inspection Incomplete/Unqualified ☐ Contamination ☐ Countersink ☐ Cut Too Short ☐ Instructions Incomplete/Unclear ☐ Drill Holes ☐ Power Loss/Surge ☐ Folio/Program ☐ Grain ☐ Weld ☐ Wrong Stock Pulled ☐ Out of Sequence ☐ Off-set ☐ Mislabeled ☐ Fit/Function ☐ Misaligned/off center ☐ Positioned Wrong ☐ Outside Dimensions ☐ Over/Under tolerance ☐ Part Incorrect ☐ Part Lost/Missing ☐ Part Moved ☐ Drawing ☐ Finish ☐ Misread ☐ Turning Sequence ☐			
OTHER : ☐					

DQA: _____ Date: _____



WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: _____ Date: _____

Work Order update only ☐

Work Order: _____ Part No. _____ NCR No. _____		DISPOSITION Rework ☐ Scrap ☐ Use-as-is ☐ Suspected Unapproved ☐		AGAINST DEPARTMENT/PROCESS <table style="width:100%; border: none;"> <tr> <td style="width:15%;">Skid-tube ☐</td> <td style="width:15%;">Cross tube ☐</td> <td style="width:15%;">Water Jet ☐</td> <td style="width:15%;">Engineering ☐</td> </tr> <tr> <td>Machining ☐</td> <td>Small Fab ☐</td> <td>Prod. Eng. Coord. ☐</td> <td>Quality ☐</td> </tr> <tr> <td>Thermoforming ☐</td> <td>Finishing ☐</td> <td>Rec/Store/Packaging ☐</td> <td>Other ☐</td> </tr> <tr> <td>Large Fab ☐</td> <td>Composite ☐</td> <td>Supplier ☐</td> <td></td> </tr> </table>						Skid-tube ☐	Cross tube ☐	Water Jet ☐	Engineering ☐	Machining ☐	Small Fab ☐	Prod. Eng. Coord. ☐	Quality ☐	Thermoforming ☐	Finishing ☐	Rec/Store/Packaging ☐	Other ☐	Large Fab ☐	Composite ☐	Supplier ☐	
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Design ☐	Operator ☐	Bending ☐	Set-up ☐	Folio/Program ☐	Outside Dimensions ☐																				
Doc/Data ☐	Offset/Setup ☐	Centre Not Concentric ☐	BOM/Route ☐	Grain ☐	Over/Under tolerance ☐																				
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LOA ☐	Product Improvement ☐	Wave/Twist in Tube ☐	Instructions Incomplete/Unclear ☐	Fit/Function ☐	Misread ☐																				
Substation ☐	Process Improvement ☐	Marks/Chatter ☐	Drill Holes ☐	Misaligned/off center ☐	Turning Sequence ☐																				
Past Expiry Date ☐	Manufacturing Process ☐																								
Misidentified ☐	Past Due ☐	OTHER : _____																							

Work Order ID 131616

Monday, April 20, 2015 10:11:45 AM

131616

Page 3

Item ID: D2741 Accept ***N900040100*** Setup Start ***NS1***
Revision ID: Stop ***NS2***
Item Name: Replacement Blade
Start Date: 4/20/2015 Start Qty: 30.00 ***30*** Cust Item ID:
Required Date: 4/20/2015 Req'd Qty: 30.00 ***30*** Customer:
Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____ Run Start ***NR1***
QC: _____ Date: _____ SPC (Y/N): _____ Date: _____ Stop ***NR2***

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
160	Outsource process - Heat Treat	0.00							
160									
Outsource1	Memo	90.00							
Outsource process - Heat Treat	Issue P/O: <u>28564</u> Harden material as per Dwg D2741 Min. Ultimate Tensile Strength = 152 ksi (34-40 HRC) Min. Yield Tensile Strength = 141 ksi Test report or Certification required **Sand blast parts**								
170	Receive & Inspect for Damage & Mat'l Certs	0.00							
170									
Packaging	Memo	0.01							
Packaging	Ensure Test report or Certification attached								

32 DAS 6 9-89 MAR 21 2015 32 JUN 10 2015

DQA: _____ Date: _____



WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: _____ Date: _____

Work Order update only ☐

Work Order: _____ Part No. _____ NCR No. _____		DISPOSITION Rework ☐ Scrap ☐ Use-as-is ☐ Suspected Unapproved ☐		AGAINST DEPARTMENT/PROCESS Skid-tube ☐ Machining ☐ Thermoforming ☐ Large Fab ☐ Cross tube ☐ Small Fab ☐ Finishing ☐ Composite ☐ Water Jet ☐ Prod. Eng. Coord. ☐ Rec/Store/Packaging ☐ Supplier ☐ Engineering ☐ Quality ☐ Other ☐					
Date :		Step #:		QTY Effective :			MRB (QSI042) Approval		
Description Work Order Deviation				Disposition				Completed By	
Root Cause Environment ☐ Design ☐ Doc/Data ☐ Equip/Tooling ☐ Handling/Pre ☐ Material ☐ Internal Transport ☐ Tribal Knowledge ☐ LOA ☐ Substation ☐ Past Expiry Date ☐ Misidentified ☐ No Re-verification ☐ Operator ☐ Offset/Setup ☐ Supplier ☐ Training ☐ Use for Testing ☐ Poor Information ☐ Rushing ☐ Product Improvement ☐ Process Improvement ☐ Manufacturing Process ☐ Past Due ☐		FAULT CATEGORY Pressure/Forced ☐ Bending ☐ Centre Not Concentric ☐ Cracks ☐ Crimp/Kink/Ripple/Wave ☐ Cuffs ☐ Crushing ☐ Heat Treat ☐ Wave/Twist in Tube ☐ Marks/Chatter ☐ Temperature/Cure ☐ Set-up ☐ BOM/Route ☐ Broken/Damage/Defect ☐ Inspection Incomplete/Unqualified ☐ Contamination ☐ Countersink ☐ Cut Too Short ☐ Instructions Incomplete/Unclear ☐ Drill Holes ☐ Power Loss/Surge ☐ Folio/Program ☐ Grain ☐ Weld ☐ Wrong Stock Pulled ☐ Out of Sequence ☐ Off-set ☐ Misabeled ☐ Fit/Function ☐ Misaligned/off center ☐ Positioned Wrong ☐ Outside Dimensions ☐ Over/Under tolerance ☐ Part Incorrect ☐ Part Lost/Missing ☐ Part Moved ☐ Drawing ☐ Finish ☐ Misread ☐ Turning Sequence ☐		OTHER : _____					

Work Order ID 131616

131616

Monday, April 20, 2015 10:11:45 AM

Item ID: D2741

Accept

N900040100

Setup Start ***NS1***

Revision ID:

Stop ***NS2***

Item Name: Replacement Blade

Start Date: 4/20/2015 Start Qty: 30.00

30

Cust Item ID:

Required Date: 4/20/2015 Req'd Qty: 30.00

30

Customer:

Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

Run Start ***NR1***

QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Stop ***NR2***

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
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180

QC5- Inspect part completeness to step on W/O

0.00

180

QC

Memo

0.01

Quality Control

DAS
27
9-89

32

JUN 23 2015

190

0.00

190

HandFinish

Memo

0.02

Hand Finishing

clean with wash & wipe to remove oil

~~32~~ 15-7-16 DOL
15-7-16 DOL

200

White Gloss(Ref:4.3.5.2) per QSI005 4.3-Steel

0.00

200

Powdercoat

Memo

0.01

Powder Coating

START TIME: 10:05

OVEN TEMPERATURE: 400°

FINISH TIME: 10:35

M1B1545

32 15-7-22 DAS 34 9-89

DQA: _____ Date: _____



WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: _____ Date: _____

Work Order update only ☐

Work Order: _____ Part No. _____ NCR No. _____		DISPOSITION Rework ☐ Scrap ☐ Use-as-is ☐ Suspected Unapproved ☐		AGAINST DEPARTMENT/PROCESS <table style="width:100%; border: none;"> <tr> <td style="border: none;">Skid-tube ☐</td> <td style="border: none;">Cross tube ☐</td> <td style="border: none;">Water Jet ☐</td> <td style="border: none;">Engineering ☐</td> </tr> <tr> <td style="border: none;">Machining ☐</td> <td style="border: none;">Small Fab ☐</td> <td style="border: none;">Prod. Eng. Coord. ☐</td> <td style="border: none;">Quality ☐</td> </tr> <tr> <td style="border: none;">Thermoforming ☐</td> <td style="border: none;">Finishing ☐</td> <td style="border: none;">Rec/Store/Packaging ☐</td> <td style="border: none;">Other ☐</td> </tr> <tr> <td style="border: none;">Large Fab ☐</td> <td style="border: none;">Composite ☐</td> <td style="border: none;">Supplier ☐</td> <td></td> </tr> </table>						Skid-tube ☐	Cross tube ☐	Water Jet ☐	Engineering ☐	Machining ☐	Small Fab ☐	Prod. Eng. Coord. ☐	Quality ☐	Thermoforming ☐	Finishing ☐	Rec/Store/Packaging ☐	Other ☐	Large Fab ☐	Composite ☐	Supplier ☐	
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Work Order ID 131616

131616

Page 5

Monday, April 20, 2015 10:11:45 AM

Item ID: D2741

Accept

N900040100

Setup Start *NS1*

Revision ID:

Stop *NS2*

Item Name: Replacement Blade

Start Date: 4/20/2015 Start Qty: 30.00

30

Cust Item ID:

Required Date: 4/20/2015 Req'd Qty: 30.00

30

Customer:

Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

Run Start *NR1*

QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Stop *NR2*

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
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210

QC3- Inspect Part Finish

0.00

210

QC

Memo

0.01

Quality Control

32

38
9-89

JUL 27 2015

220

Identify as per dwg & Stock Location: ST538

0.00

220

Packaging

Memo

0.01

Packaging

DAS
27
9-89 JA

JUL 27 2015

230

QC21- Final Inspection - Work Order Release

0.00

230

QC

Memo

0.05

Quality Control

15/1/27 48

20150727

DQA: _____ Date: _____



WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: _____ Date: _____

Work Order update only ☐

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Marks/Chatter ☐	Drill Holes ☐	Misaligned/off center ☐	Turning Sequence ☐																																																																						
OTHER : ☐																																																																									

Picklist Print

Monday, April 20, 2015 10:11:48 AM

Page 1

Work Order ID: 131616

131616

Parent Item: D2741

D2741

Parent Item Name: Replacement Blade

Start Date: 4/20/2015

Required Date: 4/20/2015

Start Qty: 30.00

Required Qty: 30.00

Comments: IPP Rev: D00.11.15Removed P/O turning - in house processEC
IPP Rev: E 06-03-20 As Per Rev C JLM
IPP Rev: F 06.04.20Added grinding after heat treating EC

Component Item ID/ Item Name	Replacement Item ID	Mfg/ Purch	Bin Item	Primary Location	Last Location	Route Seq ID	Unit of Measure	Qty on Hand	Qty per Kit	Total Qty	Qty Issued	Date Issued	Status
M4130NB0.500X03.00 0		Purchased	No			100	f	37.2000	1.1541	37			

M4130NB0 500X03 000

4130 Bar 0.500 x 3.00

Handwritten: 15/04/24

Location

Loc Qty

Loc Code

MAT

37.2

m131783

37.2

37.2

DQA: _____ Date: _____



WORK ORDER NON-CONFORMANCE / UPDATE

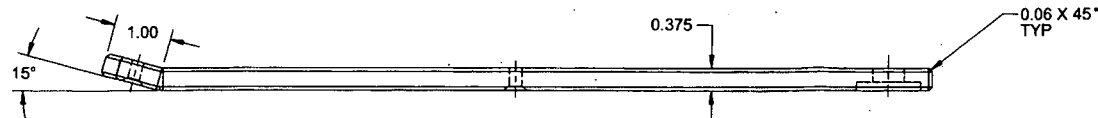
QA Closed: _____ Date: _____

Work Order update only ☐

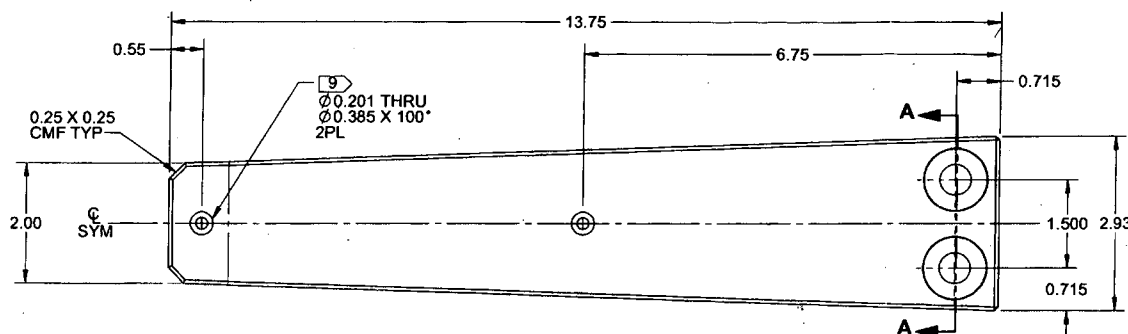
Work Order: _____ Part No. _____ NCR No. _____		DISPOSITION Rework ☐ Scrap ☐ Use-as-is ☐ Suspected Unapproved ☐		AGAINST DEPARTMENT/PROCESS <table style="width: 100%; border: none;"> <tr> <td style="width: 15%;">Skid-tube ☐</td> <td style="width: 15%;">Cross tube ☐</td> <td style="width: 15%;">Water Jet ☐</td> <td style="width: 15%;">Engineering ☐</td> </tr> <tr> <td>Machining ☐</td> <td>Small Fab ☐</td> <td>Prod. Eng. Coord. ☐</td> <td>Quality ☐</td> </tr> <tr> <td>Thermoforming ☐</td> <td>Finishing ☐</td> <td>Rec/Store/Packaging ☐</td> <td>Other ☐</td> </tr> <tr> <td>Large Fab ☐</td> <td>Composite ☐</td> <td>Supplier ☐</td> <td></td> </tr> </table>						Skid-tube ☐	Cross tube ☐	Water Jet ☐	Engineering ☐	Machining ☐	Small Fab ☐	Prod. Eng. Coord. ☐	Quality ☐	Thermoforming ☐	Finishing ☐	Rec/Store/Packaging ☐	Other ☐	Large Fab ☐	Composite ☐	Supplier ☐																																															
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Date :		Step #:		QTY Effective :				MRB (QSI042) Approval																																																															
Description Work Order Deviation				Disposition				Completed By																																																															
								Lead hand / Supervisor Approval Verification																																																															
								QC / QA Coordinator Approval																																																															
Root Cause <table style="width: 100%; border: none;"> <tr> <td style="width: 15%;">Environment ☐</td> <td style="width: 15%;">No Re-verification ☐</td> <td style="width: 15%;">Pressure/Forced ☐</td> <td style="width: 15%;">Temperature/Cure ☐</td> <td style="width: 15%;">Power Loss/Surge ☐</td> <td style="width: 15%;">Positioned Wrong ☐</td> </tr> <tr> <td>Design ☐</td> <td>Operator ☐</td> <td>Bending ☐</td> <td>Set-up ☐</td> <td>Folio/Program ☐</td> <td>Outside Dimensions ☐</td> </tr> <tr> <td>Doc/Data ☐</td> <td>Offset/Setup ☐</td> <td>Centre Not Concentric ☐</td> <td>BOM/Route ☐</td> <td>Grain ☐</td> <td>Over/Under tolerance ☐</td> </tr> <tr> <td>Equip/Tooling ☐</td> <td>Supplier ☐</td> <td>Cracks ☐</td> <td>Broken/Damage/Defect ☐</td> <td>Weld ☐</td> <td>Part Incorrect ☐</td> </tr> <tr> <td>Handling/Pre ☐</td> <td>Training ☐</td> <td>Crimp/Kink/Ripple/Wave ☐</td> <td>Inspection Incomplete/Unqualified ☐</td> <td>Wrong Stock Pulled ☐</td> <td>Part Lost/Missing ☐</td> </tr> <tr> <td>Material ☐</td> <td>Use for Testing ☐</td> <td>Cuffs ☐</td> <td>Contamination ☐</td> <td>Out of Sequence ☐</td> <td>Part Moved ☐</td> </tr> <tr> <td>Internal Transport ☐</td> <td>Poor Information ☐</td> <td>Crushing ☐</td> <td>Countersink ☐</td> <td>Off-set ☐</td> <td>Drawing ☐</td> </tr> <tr> <td>Tribal Knowledge ☐</td> <td>Rushing ☐</td> <td>Heat Treat ☐</td> <td>Cut Too Short ☐</td> <td>Mislabeled ☐</td> <td>Finish ☐</td> </tr> <tr> <td>LOA ☐</td> <td>Product Improvement ☐</td> <td>Wave/Twist in Tube ☐</td> <td>Instructions Incomplete/Unclear ☐</td> <td>Fit/Function ☐</td> <td>Misread ☐</td> </tr> <tr> <td>Substation ☐</td> <td>Process Improvement ☐</td> <td>Marks/Chatter ☐</td> <td>Drill Holes ☐</td> <td>Misaligned/off center ☐</td> <td>Turning Sequence ☐</td> </tr> <tr> <td>Past Expiry Date ☐</td> <td>Manufacturing Process ☐</td> <td colspan="4" rowspan="2" style="vertical-align: top;">OTHER : _____</td> </tr> <tr> <td>Misidentified ☐</td> <td>Past Due ☐</td> </tr> </table>				Environment ☐	No Re-verification ☐	Pressure/Forced ☐	Temperature/Cure ☐	Power Loss/Surge ☐	Positioned Wrong ☐	Design ☐	Operator ☐	Bending ☐	Set-up ☐	Folio/Program ☐	Outside Dimensions ☐	Doc/Data ☐	Offset/Setup ☐	Centre Not Concentric ☐	BOM/Route ☐	Grain ☐	Over/Under tolerance ☐	Equip/Tooling ☐	Supplier ☐	Cracks ☐	Broken/Damage/Defect ☐	Weld ☐	Part Incorrect ☐	Handling/Pre ☐	Training ☐	Crimp/Kink/Ripple/Wave ☐	Inspection Incomplete/Unqualified ☐	Wrong Stock Pulled ☐	Part Lost/Missing ☐	Material ☐	Use for Testing ☐	Cuffs ☐	Contamination ☐	Out of Sequence ☐	Part Moved ☐	Internal Transport ☐	Poor Information ☐	Crushing ☐	Countersink ☐	Off-set ☐	Drawing ☐	Tribal Knowledge ☐	Rushing ☐	Heat Treat ☐	Cut Too Short ☐	Mislabeled ☐	Finish ☐	LOA ☐	Product Improvement ☐	Wave/Twist in Tube ☐	Instructions Incomplete/Unclear ☐	Fit/Function ☐	Misread ☐	Substation ☐	Process Improvement ☐	Marks/Chatter ☐	Drill Holes ☐	Misaligned/off center ☐	Turning Sequence ☐	Past Expiry Date ☐	Manufacturing Process ☐	OTHER : _____				Misidentified ☐	Past Due ☐
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FIRST ARTICLE INSPECTION CHECKLIST

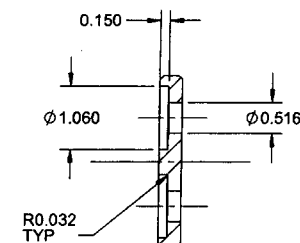
Rev	Date	Change	Revised by	Approved
A	03.12.22	New Issue	KJ/RF	
B	06.03.09	Revised per Rev. C	KJ/JLM	
C	13.09.24	Dwg Rev updated	KJ	
D	13.10.08	Dimensions updated	KJ	
E	14.05.06	Dwg Rev updated	KJ.	



D2741 BLADE
(MAKE FROM D2741F)



D2741F FLAT PATTERN



SECTION A-A

RELEASED
2014-04-06
MD

NOTES:

- 1) MATERIAL: AISI 4130N STEEL BAR PER MIL-S-6758 OR AMS 6345/6348/6370/6528
REF DART SPEC. M4130N-B0.500X3.000
- 2) FINISH: D2741: POWDER COAT "WHITE" (4.3.5.2) PER DART QSI 005 4.3
D2741-NP: NO PAINT
- 3) TOLERANCES: PER DART QSI 018 UNLESS OTHERWISE NOTED
- 4) UNITS: INCHES UNLESS OTHERWISE NOTED
- 5) BREAK SHARP EDGES: 0.030 TO 0.060 MAX
- 6) IDENTIFICATION: WITH DART P/N "D2741" OR D2741-NP, AND B/N "BXXXXX", PER DART QSI 044 6.1 (FINE POINT PAINT MARKER)
- 7) WEIGHT: 3.3 lbs
- 8) HEAT TREAT TO MIN. ULTIMATE TENSILE STRENGTH = 152 ksi AND MIN. YIELD TENSILE STRENGTH = 141 ksi
PER MIL-S-6758 OR AMS2759/1E AFTER MACHINING.
ACCEPTABLE TO VERIFY TENSILE STRENGTH BY HARDNESS TEST PER ASTM E18 TO 34-40 HRC.
- 9) OPTIONAL: ONLY REQUIRED WHEN MAKING D350-636-215/-216/-217/-218, NOT APPLICABLE ON D2741-NP.

131616 MLS
150420

REV.	DESCRIPTION	BY	DATE
E	ADD D2741-NP (NO PAINT) OPTION (ZN A8-1)	DB	13.08.29
D	ADD Ø0.201 HOLES AND NOTE 10 (ZN D7-1) REMOVE -041/-043 OPTIONS REFORMAT DWG. REF PAR11-72	SFM	13.02.21
C	LARGER HOLE, ADD RADIUS AND CHAMFER ADD -041/-043 OPTIONS	PH	06.01.12
B	CHANGE C'SINK TO C'BORE	CP	98.09.01
A	NEW ISSUE	DS	98.04.16
DESIGN	DS	DART AEROSPACE USA, INC. KENT, WA	
DRAWN	DB		
CHECKED	AP	DRAWING NO.	REV. E
MFG. APPR.	AP	D2741	SHEET 1 OF 1
APPROVED	AP	TITLE	SCALE
DE APPR.	AP	BLADE	NTS
DATE	13.08.29	COPYRIGHT © 1998 BY DART AEROSPACE USA, INC. THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE USA, INC.	

METCOR INC.

560 BOUL. ARTHUR-SAUVÉ
ST-EUSTACHE, QC J7R 5A8
Tel: 450-473-1884 / Fax: 450-491-5498

Reçu de livraison

Delivery Receipt

BON DE TRAVAIL Order	EXPÉDITEUR Shipper ID	BON D'EXPÉDITION Shipper
302562	1	102999

EXPÉDITION COMPLÈTE / Shipped Complete

CLIENT /Customer 215

DART AEROSPACE
1270 ABERDEEN
HAWKESBURY, ON K6A 1K7
Ph: 613-632-5200
Fax: 613-632-1053



LIVRÉ À /Shipped To

DART AEROSPACE
1270 ABERDEEN
HAWKESBURY, ON K6A 1K7
Ph: 613-632-5200
Fax: 613-632-1053

COMMANDE DU CLIENT Customer PO	BON DE LIVRAISON DU CLIENT Customer Shipper No.	TYPE DE MATÉRIEL Material Type	DATE DE LA COMMANDE Order Date	TRANSPORTEUR Carrier
28564		4130	2015/5/22	FED

QUANTITÉ Quantity	No. PIÈCE / Part No.	NOM DE LA PIÈCE / Part Name	DESCRIPTION DE LA PIÈCE Part Description	POIDS Weight
----------------------	-------------------------	--------------------------------	---	-----------------

32 D2741 111,36
BLADE
(32) D2741 131616
+ 3 TESTS BAR

3 BOITE DE CARTON

TYPE DE CONTENEUR Container Type	# DE CONTENEURS # Of Containers	COMMENTAIRES CONTENEUR Container Comments
BOITE DE CARTON	3	

CERTIFICAT

EMPAQUETAGE Packing	
-------------------------------	--

QUANTITÉ EXPÉDIÉE / Quantity Shipped : 32
POIDS EXPÉDIÉ / Weight Shipped : 111,36
QUANTITÉ RESTANTE / Quantity Remaining : 0
POIDS RESTANT / Weight Remaining : 0,00

CERTIFICAT

QUANTITÉ EXPÉDIÉE /Quantity Shipped:	32
POIDS EXPÉDIÉ / Weight Shipped :	111,36

Signature:

Date:

METCOR INC.

560 BOUL. ARTHUR-SAUVÉ, ST-EUSTACHE, QC, J7R 5A8

Tél.: 450-473-1884

Télécopieur / Fax administration: 450-491-5498

Télécopieur / Fax production: 450 491-6454

Rapport d'Inspection**Inspection Report**

BON DE TRAVAIL order	CHARGEMENT load
302562	1

CLIENT / customer 215

DART AEROSPACE

1270 ABERDEEN

HAWKESBURY

ON K8A 1K7

LIVRÉ À / shipped to:

DART AEROSPACE

1270 ABERDEEN

HAWKESBURY

ON K8A 1K7

1

COMMANDE DU CLIENT customer po	BON DE LIVRAISON DU CLIENT customer shipper no.	MATÉRIEL material	MAÎTRE D'OEUVRE prime contractor	PROGRAM
28564		4130		
<u>SPÉCIFICATIONS DU PROCÉDÉ</u> processing specifications SEL HARDEN HARDEN AND TEMPER SAE AMS 2759/1 REV.E				
EXIGENCE / requirement SPÉCIFICATIONS / specified TESTS EXÉCUTÉS / performed RÉSULTATS DE TESTS / results HARDNESS 34 - 40 HRC 32 38 - 40 HRC				
QUANTITÉ quantity	POIDS weight	DESCRIPTION DES PIÈCES parts description		
32	111,36	D2741 BLADE (32) D2741 131616 3 BOITE DE CARTON		

COMMENTAIRES / comments

05/06/2015

APPROUVÉ par / Approved by:



DATE: 2015-06-05

RECEIVED

DATE 50.12.02

COMMUNICATIONS

RECEIVED

30.12.02

OFFICE

SECRET

RECEIVED

RECEIVED

30.12.02

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METCOR INC.

560 BOUL. ARTHUR-SAUVÉ, ST-EUSTACHE, QC, J7R 5A8

Tél.: 450-473-1884

Télécopieur / Fax administration: 450-491-5498

Télécopieur / Fax production: 450 491-6454

Certificat de Conformité Détaillé

Detailed Certificate of Compliance

BON DE TRAVAIL order	CHARGEMENT load
302562	1

CLIENT / customer 215

DART AEROSPACE

1270 ABERDEEN

HAWKESBURY

ON K6A 1K7

LIVRÉ À / shipped to:

DART AEROSPACE

1270 ABERDEEN

HAWKESBURY

ON K6A 1K7

1

COMMANDE DU CLIENT customer po	BON DE LIVRAISON DU CLIENT customer shipper no.	MATÉRIEL material	MAÎTRE D'OEUVRE prime contractor	PROGRAM
28564		4130		

SPÉCIFICATIONS DU PROCÉDÉ processing specifications

SEL HARDEN

HARDEN AND TEMPER

SAE AMS 2759/1 REV.E

EXIGENCE / requirement	SPÉCIFICATIONS / specified	TESTS EXÉCUTÉS / performed	RÉSULTATS DE TESTS / results
HARDNESS	34 - 40 HRC	32	38 - 40 HRC
TENSILE	152 - 182 KSI	1	177 - 177 KSI
From Exova Lab no 30378			

QUANTITÉ quantity	POIDS weight	DESCRIPTION DES PIÈCES parts description
32	111.36	D2741 BLADE (32) D2741 131616 + 3 TESTS BAR 3 BOITE DE CARTON

Operation	Temp. spécifiée Specified Temp	Temps de trempe Spécifié Specified Soak Temp	Atmosphere	Carbone Carbon Potential	Q-Media Q-Temp	Four # Furnace #	Date Départ Start Date	Heure d'entrée Time In	Heure de sortie Time Out	Date Complétée Date complete
1.00 CONT. INIT.	LAVAGE		si nécessaire							
2.00 PREPARING	COMPTAGE									
3.00 PREHEAT 1	1000 +/-25F	1:00 1:30	air			133				
4.00 SEL HARDE	1575 +/-25°F	0:40	sel		Brine	106				
5.00 WASH	150	0:30	soap							
6.00 SNAP TEMF	400 +/-10°F	2:00	air			638				

METCOR INC.

560 BOUL. ARTHUR-SAUVÉ, ST-EUSTACHE, QC, J7R 5A8

Tél.: 450-473-1884

Télécopieur / Fax administration: 450-491-5498

Télécopieur / Fax production: 450 491-6454

Certificat de Conformité Détaillé

Detailed Certificate of Compliance

BON DE TRAVAIL order	CHARGEMENT load
302562	1

CLIENT / customer 215

DART AEROSPACE

1270 ABERDEEN

HAWKESBURY

ON K6A 1K7

LIVRÉ À / shipped to:

DART AEROSPACE

1270 ABERDEEN

HAWKESBURY

ON K6A 1K7

1

Operation	Temp. spécifiée Specified Temp	Temps de trempe Spécifié Specified Soak Temp	Atmosphère	Carbone Carbon Potential	Q-Media Q-Temp	Four # Furnace #	Date Départ Start Date	Heure d'entrée Time In	Heure de sortie Time Out	Date Complétée Date complete
7.00 SANDBLAS			Sablage							
8.00 DIST INSP										
9.00 TEMPER	875 +/-10°F	4 hrs	air			612				
10.00 HARDN INS										
11.00 TENSILE										
12.00 SANDBLAS			Sablage							
13.00 HUILAGE			huile	bassin 525						
14.00 FINAL INSP							06-15-2015			06-15-2015

COMMENTAIRES / comments

Le traitement thermique (TT) a été fait en utilisant des équipements en conformité avec AMS2759 et AMS 2750. Le TT a été fait tel que requis par AMS2759 et toutes les vérifications et les tests demandés ont été faites et documentés. Aucun changement n'a été fait par rapport au TT. On certifie que le matériel a été fabriqué, échantillonné, testé et inspecté en accord avec AMS2759 et le bon de commande et le matériel rencontre les exigences spécifiées.

Heat treatment (HT) was performed with equipment that meets the requirements of AMS2759 & AMS2750. All HT operations were in compliance with AMS2759 and all verifications have been performed and documented. No unauthorized changes were performed in regards to the HT. We certify that the material was manufactured, sampled, tested and inspected in accordance with AMS2759 and the purchase order and was found to meet the requirements.

APPROUVÉ par / Approved by:

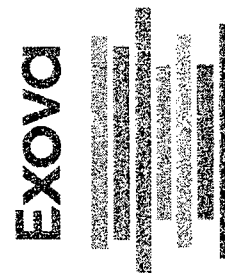
Isabel Otero
Isabel Otero
QA Technician

DATE: 2015-06-17

/ Nous certifions que toute l'information comprise sur ce rapport est exacte et conforme aux requis du client./We certify that all the information on this report is exact and in accordance with the order requirements.

Exova
121 Boulevard Hymus
Pointe-Claire
Québec
Canada
H9R 1E6

T: +1 (514) 697-3273
F: +1 (514) 697-2090
C: ventes@exova.com
W: www.exova.com



TEST CERTIFICATE

METCOR INC.

560 BOUL ARTHUR-SAUVE
ST-EUSTACHE, Québec
J7R5A8

Requested by SORIN IONESCU

Lab #: 30378
COA #: 32023
Issue #: 1
Date: 2015-06-16

Material: Steel
Shape: NA
Condition: Not Applicable

PO 1190
P.O. Client 28564
W.O. 302562

Material 4130
Client Dart
Description D2741

Identification test L: 5.00" C X X: 0.515" X 0.530"
piece

ROOM TEMPERATURE TENSILE TEST

Sample	Label	Form	Diam (in)	gage (prop)	GL (in)	Yield (method)	YS (ksi)	UTS (ksi)	Elong (%)	RA (%)	Fracture (location)
68945	W.O. 302562 - 1	Round	0.350	4d	1.400	0.2% off.	168	177	11.1	43.1	center
	Cust Repts-Metcor Ten Min						141	152			
	Cust Repts-Metcor Ten Max							182			

Test Method: ASTM E8/E8M-13a

DISPOSITION

The sample(s) meet the Tensile requirements of Cust Repts - Metcor Tensile (Tensile 152-182/141).

Aerospace/military samples shall be retained for 6 months, other samples, see contract terms and conditions.

The recording of false, fictitious or fraudulent statements or entries on this document may be punished as a felony under federal law.

* Denotes the laboratory is accredited to the identified test method by ISO 17025 but not by NadCap.

** Denotes the laboratory is not accredited to the identified test method by ISO 17025 or NadCap.

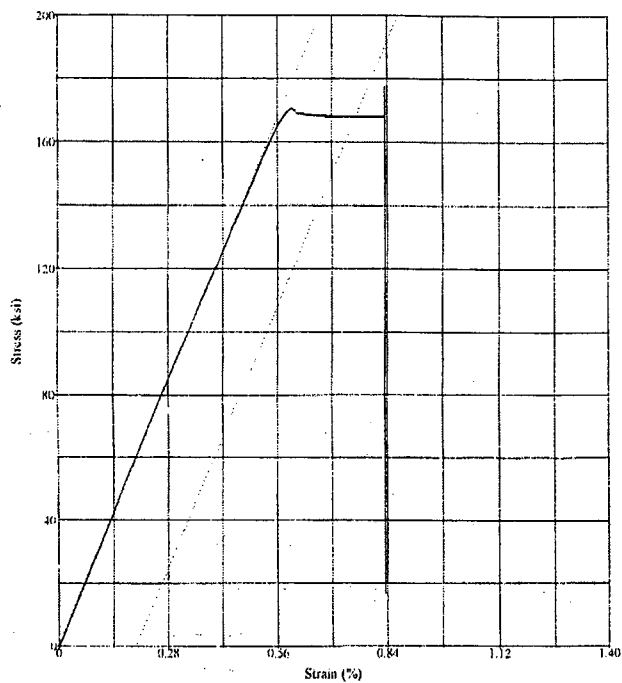
Pascal Roussy, M. Ing., ing./Eng. #125772,
Manager, metallurgy and mechanical testing

Vincent Carstensen



EXOD

Test Results



Test Summary

Lab: 30378
Sample: 068945
Operator #: YL
Work Order: 302562-1
Start Date: 2015-06-15
Observation:



Dart Aerospace Ltd.
1270 Aberdeen Street
Hawkesbury, ON K6A 1K7
Tel: 613 632 9577
Fax: 613 632 1053

PURCHASE ORDER

Purchase Order ID PO28564

Purchase Order Date 5/21/2015

PO Print Date 5/21/2015

Page Number 1 of 2

Order From :

VC-MET004

Ship To : DART AEROSPACE LTD

1270 ABERDEEN
HAWKESBURY, ON K6A 1K7
CANADA

METCOR INC.
560 BOUL. ARTHUR SAUVE
SAINT-EUSTACHE, QC J7R 5A8
CA

Contact Name

Vendor Phone 450 473 1884

Buyer

Chantal Lavoie

Customer POID

Customer Tax #

10127-2607

Terms

Net 30

Ship To Contact

Ship To Phone

Currency

CAD

Ship Via:

FedEx Overnight collect

FOB

FCA - (Free Carrier)

Ship Acct:

Line Nbr	Reference Vendor Part Number Line Comments Delivery Comments	Description/ Mfg ID	Req Date/ Taxable Promise Date	CD	Req Qty/ Unit of Measure	PO Unit Price	Extended Price
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1	131607	646.3015 BLADE	6/17/2015 Yes 6/17/2015		4.00 ✓	\$0.00	\$0.00
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FINISH: HEAT TREAT TO 58-62 RC
ROCKWELL HARDNESS

PART ARE MADE FROM AISI A2 TOOL STEEL

PLEASE NOTE: DETAIL C OF C REQUIRED

SP15-06-01

Line Total: \$0.00

2	131616	D2741 BLADES	6/17/2015 Yes 6/17/2015		32.00 ✓ <i>15/06/15</i> <i>SL</i>	\$0.00	\$0.00
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HARDEN MATERIAL:
ULTIMATE TENSILE STRENGTH = 152 KSI
MINIMUM YIELD TENSILE STENGHT = 141 KSI
(34-40 HRC)
SAND BLAST PART AFTER HEAT TREAT

NOTE: DETAIL C OF C REQUIRED

Note:

5/21/2015



Dart Aerospace Ltd.
1270 Aberdeen Street
Hawkesbury, ON K6A 1K7
Tel: 613 632 9577
Fax: 613 632 1053

PURCHASE ORDER

Purchase Order ID **PO28564**

Purchase Order Date 5/21/2015

PO Print Date 5/21/2015

Page Number 2 of 2

Order From :

VC-MET004

Ship To : DART AEROSPACE LTD

METCOR INC.
560 BOUL. ARTHUR SAUVE
SAINT-EUSTACHE, QC J7R 5A8
CA

1270 ABERDEEN
HAWKESBURY, ON K6A 1K7
CANADA

Contact Name

Vendor Phone 450 473 1884

Ship To Contact

Ship To Phone

Ship Via: FedEx Overnight collect

Ship Acct:

Buyer

Chantal Lavoie

Customer POID

Customer Tax #

10127-2607

Terms

Net 30

Currency

CAD

FOB

FCA - (Free Carrier)

Line Total: \$0.00

3 71401-45

PROCUREMENT
QUALITY CLAUSES

6/17/2015

1.00 ✓

\$0.00

\$0.00

No

Procurement Quality Clauses

6/17/2015

A005 right of entry

A012 chemical and physical test report

A020 non-destructive test/inspection identification

A021 dart aerospace processing

A024 process certifications

A026 certification of material conformance

SP15-clb-cl

Line Total: \$0.00

PO Total: \$0.00

Note: Terms & Condition of Purchasing(Suppliers) and Procurement Quality Clauses are an integral part of our AS9100 requirements. To learn in detail, please visit www.dartaerospace.com for further explanation.

Change Nbr: 1

Change Date: 5/21/2015

560 BOUL. ARTHUR-SAUVÉ

ST-EUSTACHE, QC, J7R 5A8

Téléphone: 450-473-1884 / Fax: 450-491-5498



BON DE TRAVAIL Order	CHARGEMENT Load
302562	1

CLIENT / Customer: 213

DART AEROSPACE
1270 ABERDEEN
HAWKESBURY
Ph: 613-632-5200
Fx: 613-632-1053

ON K6A 1K7

LIVRÉ À / Shipped To:
DART AEROSPACE
1270 ABERDEEN
HAWKESBURY
Ph: 613-632-5200
Fx: 613-632-1053

ON K6A 1K7

ITAR	EAR	CGRP
NON / No	NON / No	NON / No

CLASSIFICATION PIÈCE Part Classification	PLANIFICATION GELÉE Frozen Planning
N/A	OUI / Yes

REVUE DE CONTRAT Contract Review

COMMANDE DU CLIENT Customer PO	BON DE LIVRAISON CLIENT Customer Shipper No.	TYPE DE MATÉRIEL Material Type	MAÎTRE D'OEUVRE Prime Contractor	PROGRAM
28564		4130		

Quantité Quantity	Poids Weight	No. PIÈCE / NOM DE LA PIÈCE / DESCRIPTION DE LA PIÈCE Part Number / Part Name / Part Description	TYPE DE CONTENEUR Container Type	# DE CONTENEURS # Of Containers
32	111,36	D2741 BLADE	BOITE DE CARTON	3

(32) D2741 131616

3 BOITE DE CARTON

SPÉCIFICATION DU PROCÉDÉ / Processing Specifications

SEL HARDEN.

HARDEN AND TEMPER

SAE AMS 2759/1 REV.E

PROCÉDÉ: 4130, 152-182 KSI, AMS 2759/1, 0.25-0.38"

SECTION: 0.375

Anita

Process:

INSPECTION	Mesure / Scale	Min	Max
HARDNESS	HRC	34,0	40,0
TENSILE	KSI	152,0	182,0

Operations

# Equipment	Temperature Traitement	Temps	Atmosphère	Potentiel de carbone	Media / Temp.	Temperature Debut Traitement	Date / hr / Entrée	Opérateur	Date / hr / Sortie	Opérateur
1	CONT INITIAL / INITIAL CONT.									
	LAVAGE		si nécessaire							

COMMENTAIRE: Avant de charger les pièces, veuillez vous assurer qu'elles ne contiennent pas d'huile, de copeaux de métal, de dommages apparents, de calamine ou autres impuretés en surface.

Les températures sont en degrés Fahrenheit. Les temps sont en heures et en minutes. Les débits sont en CFH, sauf indication contraire.